

# MAXWELL JONES

✉ mjjones2@andrew.cmu.edu  
🌐 maxwelljjon.es  
☎ 6318044114  
in maxwelljones14  
🔗 maxwelljones14

I'm a Artificial intelligence and math double major at Carnegie Mellon University, graduating in 2023. I'm interested in AI/ML as well as software engineering.

## Skills

### PROGRAMMING LANGUAGES

Python  
Java  
C  
Javascript  
HTML/CSS  
LaTeX  
SQL  
Julia

### TOOLS/Frameworks

NumPy  
Pytorch  
SciPy  
Unix Command Line  
Git  
Sklearn  
Keras  
Pandas  
Jupyter Notebook  
regex  
Matplotlib

### COURSEWORK

15-485 Intro to Deep Learning  
16-385 Computer Vision  
10-703 Deep Reinforcement Learning  
10-725 Convex Optimization  
10-315 Intro to Machine Learning  
15-281 Artificial Intelligence  
15-210 Parallel Algorithms  
15-213 Computer Systems  
21-484 Graph Theory  
15-251 Theoretical Computer Science

### HOBBIES/INVOLVEMENT

Origami  
Chess  
Basketball  
Kappa Sigma Fraternity

## Education

Thomas Jefferson High School for Science and Technology  
High School Diploma 2019  
GPA: 4.1/5.0  
Sept. 2015 to May 2019

Carnegie Mellon University  
BS Mathematics 2023  
BS Artificial Intelligence 2023  
GPA: 4.0/4.0  
Sept. 2019 to Current

## Employment

Meta | FAIR Labs  
Software Engineer/Machine Learning Intern  
May 2022 to Current

- Working on paper to systematically benchmark algorithmic **Bias Amplification** of models from biased datasets with different levels of bias
- Measuring how the affects of a a specific feature in an image(ex: grass versus snow) may affect classification of an object(ex: dog versus wolf)
- Using **ResNet-18** using **ClassyVision** and **Pytorch** to benchmark bias for controlled subsets of **The Visual Genome** dataset
- Specifically, creating custom biased datasets, running experiments, and **Cleaning Data** for **Image Classification**
- Lead Team Meetings** every week with respect to the project, specifically peers and co-authors on **Computer Vision FAIR** team

Meta | Probability and Uncertainty  
Software Engineer Intern  
Remote  
May 2021 to Aug. 2021

- Developed a data perturbation training/evaluating/testing pipeline in **Python** for the Probability: Uncertainty team, leveraging **Pytorch** for main testing
- Tested on probabilistic models including **Bayesian**, **Ensemble**, and **Dropout** focused networks modeled off of **LeNet-5** for performance
- Measured how well these probabilistic models performed on perturbed image data(**Random Cropping**, **Rotation**, **Jittering**) w.r.t non-probabilistic models
- Created visualizations using **Matplotlib** for presentation
- Specifically focused on **MNIST** and **FashionMNIST** datasets, comparing different model architectures

Carnegie Mellon University  
(Head) Teaching Assistant  
Fall 2020 to Current

- Teaching Assistant for 15-251 Theoretical Ideas in Computer Science, head TA for 15-151 Concepts of Mathematics (Spring and Fall, respectively)
- Teach 20-student recitation twice per week, host office hours, and lead review sessions
- Design/Lead staff meetings, coordinate TA-Professor interactions, **delegate TA responsibilities** for Concepts
- Help **design exams**/update problem sets, **update course structure** for Concepts

Fiat Chrysler Automobiles  
Data Science Intern  
Remote  
May 2020 to Aug. 2020

- Tasked to increase accuracy for absentee worker prediction at all plants (absentee predictions inform numbers for necessary temp workers)
- Improved performance by using **Random Forests**, cross referencing crew attendance across plants
- Queried data from **PostgreSQL** database and used **Pandas** library to store query results
- Optimized the HR absentee prediction model in Python resulting in a **2% increase in accuracy**

## Projects

Semi Supervised Learning Research, Carnegie Mellon University  
Fall 2021 to Current

- Currently working on research in scalable graph-based Semi-Supervised Machine Learning project with PHD student under Dr. Nina Balcan
- Using **Python** and **SciPy**, finding **Harmonic Objectives**, leveraging **K-Nearest Neighbor** graphs and iterative solvers for speedup
- Evaluating on **MNIST**, **CIFAR**, and common **NLP** datasets such as 20-newsgroups dataset with **Sklearn** using **Bag of Words** approach for over 100x speedup on large graphs

Battlecode (codebase)  
Jan. 2022

- Worked on team of 4, coding an AI bot in **Java** to compete in a tournament run every year by MIT
- Leveraged **distributed** communication **algorithms** and **pathfinding** to increase bot's effectiveness
- Implemented **bit packing** methods, data structures such as **Priority Queues** and **Stacks**, and **K-Means Clustering** to improve performance
- Placed top 10 out of 250 teams internationally(2021, 2022), 1st out of all first-time teams(2021)

TartanHacks: Spot your Mood! (codebase)  
Feb. 2021

- Created an add on for **Spotify** using **Python** and **Flask** on team of 4 to track mood of users listening over time, as well as mood of specific playlists
- Developed **Vector Embeddings** for mood based on **Spotify API** metadata and sentiment analysis
- Used **Euclidean Distance** in the **Embedding Space** to execute recommendation decisions
- Functionality for both song and playlist generation based on mood factors and specific genres that users liked
- Developed graphs of mood over time based on users past listening

TartanHacks: WalkSafe! (codebase)  
Feb. 2020

- Developed a Python program on team of 4 that calculates safe and efficient walking paths at night in New York City
- Created a weighted graph from crime and street data and implemented an **A\* Pathfinding** algorithm to generate optimal paths
- Integrated **Open Street Map API** and fetched data from NYPD crime database REST endpoint